Abstract submitted for Celebration of Women in Australian Mathematical Sciences

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Title: Attack detection and correction for linear systems
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Session: Cryptography, Coding and Compression

This talk is concerned with feedback controlled systems. In recent years there have been several events around the world where such systems have been cyber attacked, resulting in malfunctioning and damage. There is currently a need for an automated response as part of the resilience of the system. I will consider the scenario where the attacker, with knowledge of the linear system dynamics, attacks a restricted number of system outputs over time. I will introduce the notion of system's "security index" as an analogon of "minimal distance" in linear coding theory. I will then specify the appropriate canonical form of the system representation and present practical attack detection and automated attack correction methods.